

CLAIMS

1. A method of making a bending wave panel loudspeaker, comprising rigidly coupling a lever to a panel edge or marginal portion such that the lever extends at an angle  
5 to the plane of the panel, coupling a bending wave exciter to the lever whereby bending wave energy is coupled to the panel to provide an acoustic output when the exciter is fed with a signal and supporting the panel on a suspension positioned outboard of the lever.
- 10 2. A method according to claim 1, comprising arranging the lever to be in the form of a flange extending along the panel edge or along a marginal portion of the panel.
3. A method according to claim 2, comprising arranging the flange to extend part-way along the panel edge or  
15 marginal portion or to be co-extensive with the panel edge.
4. A method according to any one of claims 1 to 3, comprising arranging levers or flanges on a pair of opposite edges or marginal portions of the panel, and  
20 coupling each lever or flange to a vibration exciter whereby the bending wave panel can be operated as a stereo device.
5. A method according to claim 4, comprising arranging a lever or flange on an adjacent edge or marginal portion of  
25 the panel, and coupling a vibration exciter to the lever or flange on the adjacent edge or marginal portion to provide a multiple channel acoustic output.
6. A method according to any preceding claim, comprising

driving the lever or flange into resonance by the associated vibration exciter.

7. A method according to any preceding claim, comprising selecting a distributed mode device as a vibration  
5 exciter.

8. A method according to any preceding claim, comprising positioning the exciter inboard of the lever or flange.

9. A method according to any preceding claim, comprising applying force to the lever or flange via the vibration  
10 exciter generally in the plane of the panel.

10. A method according to any one of claims 1 to 8, comprising applying force to the lever or flange via the exciter generally normally to the plane of the panel.

11. A method according to claim 10, comprising providing  
15 the lever or flange with a return lip at its end remote from the panel, and coupling the vibration exciter to the return lip.

12. A method according to any preceding claim, wherein the bending wave panel is driven into resonance by the or  
20 each exciter.

13. A method according to claim 12, wherein the resonance is of the distributed mode kind.

14. A bending wave panel-form loudspeaker having a lever rigidly coupled to a marginal portion or edge of the  
25 panel, a vibration exciter coupled to the lever to apply bending wave energy to the panel to produce an acoustic output and a panel suspension positioned outboard of the lever.

15. A loudspeaker according to claim 14, wherein the lever is in the form of a flange extending along the panel edge or along a marginal portion of the panel.

16. A loudspeaker according to claim 15, wherein the  
5 flange extends part-way along the panel edge or marginal portion or is co-extensive with the panel edge.

17. A loudspeaker according to any one of claims 14 to 16, wherein levers or flanges are provided on a pair of opposite edges or marginal portions of the panel, each  
10 lever or flange being coupled to a vibration exciter whereby the loudspeaker may be operated as a stereo device.

18. A loudspeaker according to claim 17, wherein a lever or flange is provided on an adjacent edge or marginal  
15 portion of the panel, the lever or flange on the adjacent edge or marginal portion being coupled to a vibration exciter to provide a multiple channel acoustic output.

19. A loudspeaker according to any one of claims 14 to 18, wherein the lever or flange is adapted to be driven  
20 into resonance by the associated vibration exciter.

20. A loudspeaker according to any one of claims 14 to 19, wherein the vibration exciter is a distributed mode device.

21. A loudspeaker according to any one of claims 14 to  
25 20, wherein the exciter is placed inboard of the lever or flange.

22. A loudspeaker according to any one of claims 14 to 21, wherein the vibration exciter is adapted to apply

force to the lever or flange generally normal to the plane thereof.

23. A loudspeaker according to any one of claims 14 to 21, wherein the vibration exciter is adapted to apply  
5 force to the lever or flange generally in the plane of the panel.

24. A loudspeaker according to claim 23, wherein the lever or flange comprises a return lip at its end remote from the panel, and wherein the vibration exciter is  
10 coupled to the return lip.

25. A loudspeaker according to any one of claims 14 to 24, wherein the bending wave panel is adapted to resonant to produce an acoustic output.

26. A loudspeaker according to claim 25, wherein the  
15 bending wave panel is of the distributed mode kind.

27. A small electronic device having a display screen, and a transparent protective cover over the display screen, wherein the transparent protective cover is a loudspeaker as claimed in any one of claims 14 to 26.

20 28. A small electronic device according to claim 27, wherein the device is a mobile telephone, PDA or the like.